

PATENT ABSTRACTS OF JAPAN

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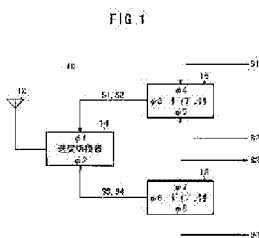
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(54) TRANSMITTER-RECEIVER



(57)Abstract:

PROBLEM TO BE SOLVED: To provide a transmitter-receiver that is downsized, the manufacturing process of which is simplified and the latitude of design freedom of which can be increased.

SOLUTION: The transmitter-receiver 10 is configured with a transmission reception changeover device 14 that is connected to an antenna 12 to select transmission or reception, a transmitter side diplexer 16 that is connected to a transmitter side terminal $\Phi 1$ of the transmission reception changeover device 14 and transmits transmission signals S1, S2 with at least two kinds of frequency bands to the transmitter side terminal $\Phi 5$ of the device 14, and a receiver side diplexer 18 that is connected to a receiver side terminal $\Phi 2$ of the transmission reception changeover device 14 and separately outputs reception signals S3, S4 with at least two kinds of frequency bands supplied from the

transmission reception changeover device 14.

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CLAIMS

[Claim(s)]

[Claim 1] The transmitter-receiver characterized by having the transmitting-side diplexer which is connected to an antenna, is connected to the transmitting-side terminal of one diplexer which switches transmission and reception, and said diplexer, and transmits the sending signal of at least two kinds of frequency bands to said transmitting-side terminal, and the receiving-side diplexer which is

connected to the receiving-side terminal of said duplexer, dissociates, respectively and outputs the input signal of at least two kinds of frequency bands.

[Claim 2] It is the transmitter-receiver characterized by for said transmitting-side diplexer having at least two band pass filters which pass the sending signal of a frequency band different, respectively in a transmitter-receiver according to claim 1, and said receiving-side diplexer having at least two band pass filters which pass the input signal of a frequency band different, respectively.

[Claim 3] Said transmitting-side diplexer is a transmitter-receiver characterized by connecting the low pass filter to the input stage of each sending signal in a transmitter-receiver according to claim 2, respectively.

[Claim 4] The transmitter-receiver characterized by carrying out the interior of said transmitting-side diplexer and said receiving-side diplexer to the same dielectric substrate in a transmitter-receiver given in any 1 term of claims 1-3.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the transmitter-receiver which can share transmission of two or more kinds of sending signals, and the input of two or more kinds of input signals with single antenna equipment.

[0002]

[Description of the Prior Art] Recently, mobile communication, a cellular phone, etc. which cover the system of two frequency bands with

one antenna are put in practical use. For example, in Europe, they are [in 900GSM (900MHz), 1800PCN (1.8GHz), and the U.S.] 800PDC (800MHz) and 1900PHS (1.9GHz) at 900 D-AMPS (900MHz), 1900TDMA (1.9GHz), and Japan.

[0003] Since these two frequency bands are covered with one antenna, the transmitter-receiver 100 as shown in drawing 5 is used.

[0004] One diplexer 104 which is connected to an antenna 102 and has the 1st and 2nd input/output terminals phi10 and phi11 as this transmitter-receiver 100 is shown in drawing 5 , The 1st diplexer 106 which is connected to the 1st input/output terminal phi 10 of this diplexer 104, and switches transmission and reception of the signal S11 of the 1st frequency band (for example, 800MHz band), It connects with the 2nd input/output terminal phi 11 of said diplexer 104, and has the 2nd diplexer 108 which switches transmission and reception of the signal S12 of the 2nd frequency band (for example, 1.8GHz band). In order to make a transmitting property good especially, the low pass filter (the 1st and 2nd low pass filters 110 and 112) is connected to each transmitting side of the 1st and 2nd duplexers 106 and 108, respectively.

[0005] And the sending signal S13 of a 800MHz band is inputted into the input terminal phi 13 of the 1st low pass filter 110, from the output terminal phi 12 of the 1st diplexer 106, the input signal S14 of a 800MHz band is outputted, the sending signal S15 of a 1.8GHz band is inputted into the input terminal phi 15 of the 2nd low pass filter 112, and the input signal S16 of a 1.8GHz band is outputted to it from the output terminal phi 14 of the 2nd diplexer 108.

[0006]

[Problem(s) to be Solved by the Invention] By the way, since a diplexer 104 can be constituted from two or more band pass filters which consist of capacity and an inductance, as shown in drawing 6 , said diplexer 104 will be constituted by forming many electrode layers in one dielectric substrate 114.

[0007] On the other hand, two duplexers 106 and 108 are formed on the dielectric substrate 114 from the need of constituting the transmit/receive switch which is used with these duplexers 106 and 108 and which is not illustrated from an PIN diode switch or a switch using a GaAs substrate.

[0008] Therefore, when producing a transmitter-receiver 100, for example, as shown in drawing 6 , the dielectric substrate 114 with which the diplexer 104 was formed in the interior is prepared first, it is mounting two duplexers 106 and 108 in the top face of the after that, for example, said dielectric, substrate 114, and said transmitter-

receiver 100 will be produced.

[0009] In this case, each size of a component part of each duplexers 106 and 108 is large, and moreover, since there are many components mark, they need to make large area for mounting two duplexers 106 and 108 in the dielectric substrate 114, and have the problem that the size of a transmitter-receiver 100 becomes large.

[0010] Moreover, since leading about of wiring with the diplexer 104 formed in the dielectric substrate 114 and two duplexers 106 and 108 mounted on the dielectric substrate 114 becomes complicated, in order to avoid it, the mounting position of each duplexers 106 and 108 must be examined in a detail, and there is a problem that the degree of freedom of a design is low.

[0011] Although it is necessary to form said 1st and 2nd low pass filters 110 and 112 with a diplexer 104 in the dielectric substrate 114 in order to attain a miniaturization especially to connect the 1st and 2nd low pass filters 110 and 112 to a transmitting side, as shown in drawing 5 The field for leading about of wiring becoming complicated also in this case, therefore forming wiring must fully be secured, and there is a possibility that the degree of freedom of a design may become still lower.

[0012] This invention is made in consideration of such a technical problem, the miniaturization of equipment itself can be attained, and it aims at moreover offering the transmitter-receiver which can realize simplification of a production process, and increase-ization of the degree of freedom of a design in a list.

[0013]

[Means for Solving the Problem] The transmitter-receiver concerning this invention is characterized by having the transmitting-side diplexer which is connected to an antenna, is connected to the transmitting-side terminal of one diplexer which switches transmission and reception, and said diplexer, and transmits the sending signal of at least two kinds of frequency bands to said transmitting-side terminal, and the receiving-side diplexer which is connected to the receiving-side terminal of said diplexer, dissociates, respectively and outputs the input signal of at least two kinds of frequency bands.

[0014] What is necessary is thereby, to form a transmitting-side diplexer and a receiving-side diplexer in the same dielectric substrate, and just to mount one diplexer in the top face of this dielectric substrate. Thus, the size of each component part is large, and since components mark can also reduce the number of many duplexers, the miniaturization of a transmitter-receiver can be attained, a production

process can also be simplified, and moreover, leading about of wiring also becomes easy and can raise the degree of freedom of a design.

[0015] And said transmitting-side diplexer has at least two band pass filters which pass the sending signal of a frequency band different, respectively, and you may make it said receiving-side diplexer have at least two band pass filters which pass the input signal of a frequency band different, respectively in said configuration.

[0016] Moreover, in order to make a transmitting property good, it is desirable to connect a low pass filter to the input stage of each sending signal in said transmitting-side diplexer, respectively. In this case, since the low pass filter which can be formed in a dielectric substrate serves as a form by which direct continuation was carried out, even if it forms a diplexer and a low pass filter in one dielectric substrate, leading about of wiring will not become easy and the degree of freedom of a design will not necessarily be restricted to the diplexer formed in a dielectric substrate.

[0017]

[Embodiment of the Invention] Hereafter, the example of a gestalt of operation of the transmitter-receiver concerning this invention is explained, referring to drawing 1 - drawing 4 .

[0018] One duplexer 14 which is connected to an antenna 12 and switches transmission and reception as the transmitter-receiver 10 concerning the gestalt of this operation is shown in drawing 1 R> 1, It connects with the transmitting-side terminal phi 1 of this duplexer 14. The sending signals S1 and S2 of at least two kinds of frequency bands for the transmitting-side terminal phi 1 of said duplexer 14 For example, the transmitting-side diplexer 16 transmitted to coincidence, It connects with the receiving-side terminal phi 2 of said duplexer 14, and has the receiving-side diplexer 18 which dissociates, respectively and outputs the input signal S3 and S4 of at least two kinds of frequency bands which were supplied from the duplexer 14.

[0019] The sending signal S1 of the 1st frequency band (for example, 800MHz band) and the sending signal S2 of the 2nd frequency band (for example, 1.8GHz band) are supplied to the 1st and 2nd input terminals phi4 and phi5 of the transmitting-side diplexer 16, respectively. And these two kinds of sending signals S1 and S2 are transmitted to a duplexer 14 through the common output terminal phi 3 in the transmitting-side diplexer 16, without interfering each other.

[0020] As shown in drawing 2 R> 2, series connection of the 1st low pass filter 20 and 1st band pass filter 22 is carried out between the 1st input terminal phi 4 and the common output terminal phi 3, between the

2nd input terminal phi 5 and the common output terminal phi 3, series connection of the 2nd low pass filter 24 and 2nd band pass filter 26 is carried out, and this transmitting-side diplexer 16 is constituted. Since band pass filters 22 and 26 can be easily constituted from capacity or an inductance in these low pass filters 20 and 24 lists, as shown in drawing 4, interior can be carried out to one dielectric substrate 50.

[0021] On the other hand, two kinds of input signals S3 and S4 from a duplexer 14 are inputted through the common input terminal phi 6, from the 1st output terminal phi 7, the input signal S3 of the 1st frequency band (for example, 800MHz band) is outputted, and the receiving-side diplexer 18 is outputted from the 2nd output terminal phi 8 as input-signal S4 of the 2nd frequency band (for example, 1.8GHz band).

[0022] As shown in drawing 3 R> 3, insertion connection of the 3rd band pass filter 30 is made between the 1st output terminal phi 7 and the common input terminal phi 6, between the 2nd output terminal phi 8 and the common input terminal phi 6, insertion connection of the 4th band pass filter 32 is made, and this receiving-side diplexer 18 is constituted. Since these band pass filters 30 and 32 can be easily constituted from capacity or an inductance, the interior of them can be carried out to one dielectric substrate 50 also in this case.

[0023] Transmission and reception switch with the transmit/receive switch which does not illustrate a duplexer 14. This transmit/receive switch will be formed for example, on the dielectric substrate 50 (refer to drawing 4) from the need of constituting from an PIN diode switch, a switch using a GaAs substrate, etc.

[0024] And what is necessary is to form the transmitting-side diplexer 16 and the receiving-side diplexer 18 in the same dielectric substrate 50, and just to mount one duplexer 14 in the top face of this dielectric substrate 50, as shown in drawing 4 when manufacturing the transmitter-receiver 10 concerning the gestalt of this operation.

[0025] Thus, the transmitter-receiver 10 concerning the gestalt of this operation has the large size of each component part, and since components mark can also reduce the number of many duplexers 14, the miniaturization of a transmitter-receiver 10 can be attained, a production process can also be simplified, and moreover, leading about of wiring also becomes easy and can raise the degree of freedom of a design.

[0026] Especially, with the gestalt of this operation, since the 1st and 2nd low pass filters 20 and 24 were connected to the input stage of each sending signals S1 and S2 in the transmitting-side diplexer 16,

respectively, a transmitting property can be made good. In this case, since it becomes the form where direct continuation of the 1st and 2nd low pass filters 20 and 24 which can similarly be formed in the dielectric substrate 50 was carried out to said transmitting-side diplexer 16 formed in the dielectric substrate 50, Even if it forms in one dielectric substrate 50 the 1st and 2nd band pass filters 22 and 26 and 1st and 2nd low pass filters 20 and 24 which constitute a diplexer, leading about of wiring will not become easy and the degree of freedom of a design will not necessarily be restricted.

[0027] In addition, the transmitter-receiver concerning this invention of the ability of various configurations to be taken is natural, without deviating not only from the gestalt of above-mentioned operation but from the summary of this invention.

[0028]

[Effect of the Invention] As explained above, according to the transmitter-receiver concerning this invention, the miniaturization of equipment itself can be attained and, moreover, simplification of a production process and increase-ization of the degree of freedom of a design in a list can be realized.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the circuitry of the transmitter-receiver concerning the gestalt of this operation.

[Drawing 2] It is the block diagram showing the circuitry of a transmitting-side diplexer.

[Drawing 3] It is the block diagram showing the circuitry of a receiving-side diplexer.

[Drawing 4] It is the perspective view showing the outline configuration of the transmitter-receiver concerning the gestalt of this operation.

[Drawing 5] It is the block diagram showing the circuitry of the transmitter-receiver concerning the conventional example.

[Drawing 6] It is the perspective view showing the outline configuration of the transmitter-receiver concerning the conventional example.

[Description of Notations]

10 -- Transmitter-receiver 12 -- Antenna

14 -- Duplexer 16 -- Transmitting-side diplexer

18 -- Receiving-side diplexer 20 -- The 1st low pass filter

22 -- The 1st band pass filter 24 -- The 2nd low pass filter

26 -- The 2nd band pass filter 30 -- The 3rd band pass filter

32 -- The 4th band pass filter 50 -- Dielectric substrate

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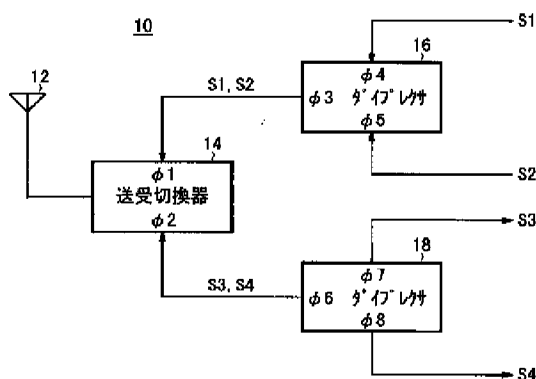
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DRAWINGS

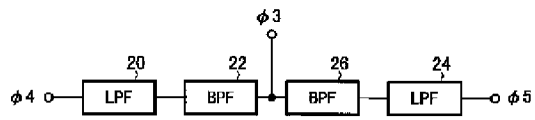
[Drawing 1]

FIG. 1



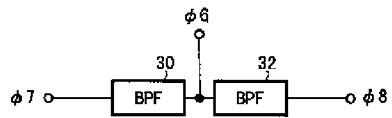
[Drawing 2]

FIG. 2



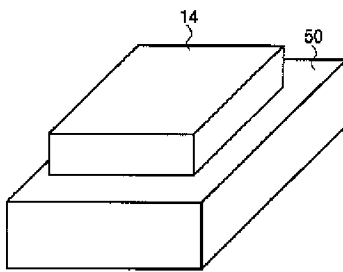
[Drawing 3]

FIG. 3



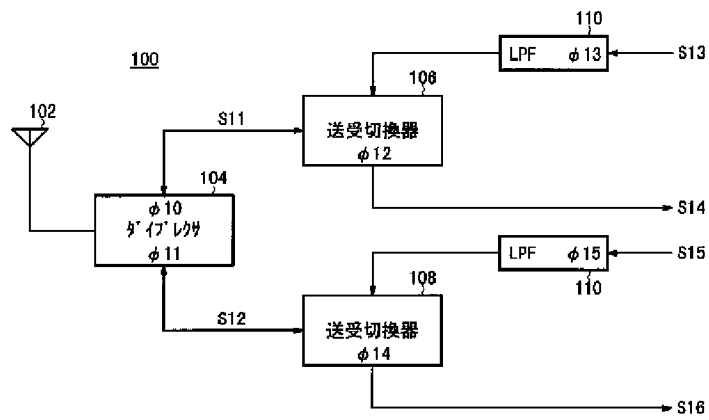
[Drawing 4]

FIG. 4



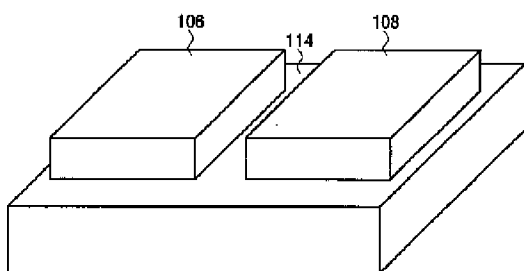
[Drawing 5]

FIG. 5



[Drawing 6]

FIG. 6



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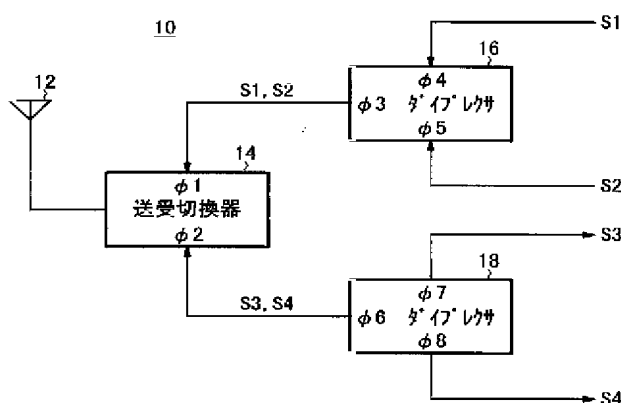
(54)【発明の名称】 送受信装置

(57)【要約】

【課題】装置自体の小型化を図り、しかも、製造工程の簡略化、並びに設計の自由度の増大化を実現させる。

【解決手段】送受信装置10は、アンテナ12に接続され、送信と受信とを切り換える1つの送受切換器14と、該送受切換器14の送信側端子φ1に接続され、少なくとも2種類の周波数帯の送信信号S1及びS2を前記送受切換器14の送信側端子φ1に伝送する送信側ダイプレクサ16と、前記送受切換器14の受信側端子φ2に接続され、送受切換器14から供給された少なくとも2種類の周波数帯の受信信号S3及びS4をそれぞれ分離して出力する受信側ダイプレクサ18とを有して構成する。

FIG. 1



【特許請求の範囲】

【請求項1】アンテナに接続され、送信と受信とを切り換える1つの送受切換器と、
前記送受切換器の送信側端子に接続され、少なくとも2種類の周波数帯の送信信号を前記送信側端子に伝送する送信側ダイプレクサと、
前記送受切換器の受信側端子に接続され、少なくとも2種類の周波数帯の受信信号をそれぞれ分離して出力する受信側ダイプレクサとを有することを特徴とする送受信装置。

【請求項2】請求項1記載の送受信装置において、
前記送信側ダイプレクサは、それぞれ異なる周波数帯の送信信号を通過させるバンドパスフィルタを少なくとも2つ有し、
前記受信側ダイプレクサは、それぞれ異なる周波数帯の受信信号を通過させるバンドパスフィルタを少なくとも2つ有することを特徴とする送受信装置。

【請求項3】請求項2記載の送受信装置において、
前記送信側ダイプレクサは、各送信信号の入力段にそれぞれローパスフィルタが接続されていることを特徴とする送受信装置。

【請求項4】請求項1～3のいずれか1項に記載の送受信装置において、
前記送信側ダイプレクサと前記受信側ダイプレクサが同一の誘電体基板に内装されていることを特徴とする送受信装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、2種類以上の送信信号の伝送と2種類以上の受信信号の入力を、単一のアンテナ装置で共用することができる送受信装置に関する。

【0002】

【従来の技術】近時、2つの周波数帯域のシステムを1つのアンテナでカバーする移動通信や携帯電話等が実用化されている。例えば、欧州では900 GSM (900 MHz) と1800 PCN (1.8 GHz)、米国では900 D-AMPS (900 MHz) と1900 TDM A (1.9 GHz)、日本では800 PDC (800 MHz) と1900 PHS (1.9 GHz) である。

【0003】これら2つの周波数帯域を1本のアンテナでカバーするために、図5に示すような送受信装置100が使われている。

【0004】この送受信装置100は、図5に示すように、アンテナ102に接続され、第1及び第2の入出力端子φ10及びφ11を有する1つのダイプレクサ104と、該ダイプレクサ104の第1の入出力端子φ10に接続され、第1の周波数帯（例えば800 MHz帯）の信号S11の送受信を切り換える第1の送受切換器106と、前記ダイプレクサ104の第2の入出力端子φ

11に接続され、第2の周波数帯（例えば1.8 GHz帯）の信号S12の送受信を切り換える第2の送受切換器108とを有する。特に、送信特性を良好とするために、第1及び第2の送受切換器106及び108の各送信側には、それぞれローパスフィルタ（第1及び第2のローパスフィルタ110及び112）が接続されている。

【0005】そして、第1のローパスフィルタ110の入力端子φ13には、例えば800 MHz帯の送信信号S13が入力され、第1の送受切換器106の出力端子φ12からは、800 MHz帯の受信信号S14が出力され、第2のローパスフィルタ112の入力端子φ15には、例えば1.8 GHz帯の送信信号S15が入力され、第2の送受切換器108の出力端子φ14からは、1.8 GHz帯の受信信号S16が出力される。

【0006】

【発明が解決しようとする課題】ところで、ダイプレクサ104は、容量とインダクタンスからなる複数のバンドパスフィルタにて構成することができ、図6に示すように、1つの誘電体基板114内に多数の電極膜を形成することによって前記ダイプレクサ104が構成されることになる。

【0007】一方、2つの送受切換器106及び108は、これら送受切換器106及び108で使用される図示しない送受信スイッチをPINダイオードスイッチ、あるいはGaAs基板を用いたスイッチにて構成する必要から誘電体基板114上に形成される。

【0008】そのため、送受信装置100を作製する場合は、例えば図6に示すように、まず、内部にダイプレクサ104が形成された誘電体基板114を用意し、その後、例えば前記誘電体基板114の上面に2つの送受切換器106及び108を実装することで、前記送受信装置100が作製されることとなる。

【0009】この場合、各送受切換器106及び108は、構成部品の個々のサイズが大きく、しかも、部品点数が多いため、誘電体基板114における2つの送受切換器106及び108を実装するための面積を広くする必要があり、送受信装置100のサイズが大きくなるという問題がある。

【0010】また、誘電体基板114内に形成されたダイプレクサ104と、誘電体基板114上に実装された2つの送受切換器106及び108との配線の引き回しが複雑になることから、それを避けるために各送受切換器106及び108の実装位置を詳細に検討しなければならず、設計の自由度が低いという問題がある。

【0011】特に、図5に示すように、送信側に第1及び第2のローパスフィルタ110及び112を接続する場合は、小型化を図るために、誘電体基板114内に前記第1及び第2のローパスフィルタ110及び112をダイプレクサ104と共に形成する必要があるが、この

場合も、配線の引き回しが複雑になり、そのため、配線を形成するための領域を十分に確保しなければならず、設計の自由度が更に低くなるおそれがある。

【0012】本発明はこのような課題を考慮してなされたものであり、装置自体の小型化を図ることができ、しかも、製造工程の簡略化、並びに設計の自由度の増大化を実現させることができる送受信装置を提供することを目的とする。

【0013】

【課題を解決するための手段】本発明に係る送受信装置は、アンテナに接続され、送信と受信とを切り換える1つの送受切換器と、前記送受切換器の送信側端子に接続され、少なくとも2種類の周波数帯の送信信号を前記送信側端子に伝送する送信側ダイプレクサと、前記送受切換器の受信側端子に接続され、少なくとも2種類の周波数帯の受信信号をそれぞれ分離して出力する受信側ダイプレクサとを有することを特徴とする。

【0014】これにより、送信側ダイプレクサと受信側ダイプレクサを同一の誘電体基板内に形成し、この誘電体基板の例えば上面に1つの送受切換器を実装すればよい。このように、各構成部品のサイズが大きくなり、部品点数も多い送受切換器の数を減らすことができるため、送受信装置の小型化を図ることができ、製造工程も簡略化することができ、しかも、配線の引き回しも簡単になり、設計の自由度を上げることができる。

【0015】そして、前記構成において、前記送信側ダイプレクサは、それぞれ異なる周波数帯の送信信号を通過させるバンドパスフィルタを少なくとも2つ有し、前記受信側ダイプレクサは、それぞれ異なる周波数帯の受信信号を通過させるバンドパスフィルタを少なくとも2つ有するようにしてもよい。

【0016】また、送信特性を良好とするために、前記送信側ダイプレクサにおける各送信信号の入力段にそれぞれローパスフィルタを接続することが好ましい。この場合、誘電体基板内に形成されるダイプレクサに、誘電体基板内に形成することが可能なローパスフィルタが直接接続されたかたちとなるため、ダイプレクサとローパスフィルタを1つの誘電体基板内に形成しても、配線の引き回しは簡単なものになり、設計の自由度が制限されるということはない。

【0017】

【発明の実施の形態】以下、本発明に係る送受信装置の実施の形態例を図1～図4を参照しながら説明する。

【0018】本実施の形態に係る送受信装置10は、図1に示すように、アンテナ12に接続され、送信と受信とを切り換える1つの送受切換器14と、該送受切換器14の送信側端子φ1に接続され、少なくとも2種類の周波数帯の送信信号S1及びS2を前記送受切換器14の送信側端子φ1に、例えば同時に伝送する送信側ダイプレクサ16と、前記送受切換器14の受信側端子φ2

に接続され、送受切換器14から供給された少なくとも2種類の周波数帯の受信信号S3及びS4をそれぞれ分離して出力する受信側ダイプレクサ18とを有する。

【0019】送信側ダイプレクサ16の第1及び第2の入力端子φ4及びφ5には、それぞれ第1の周波数帯（例えば800MHz帯）の送信信号S1と、第2の周波数帯（例えば1.8GHz帯）の送信信号S2が供給される。そして、これら2種類の送信信号S1及びS2は、送信側ダイプレクサ16において、互いに干渉し合うことなく、共通の出力端子φ3を通じて送受切換器14に伝送される。

【0020】この送信側ダイプレクサ16は、例えば図2に示すように、第1の入力端子φ4と共通の出力端子φ3間に第1のローパスフィルタ20と第1のバンドパスフィルタ22とが直列接続され、第2の入力端子φ5と共通の出力端子φ3間に第2のローパスフィルタ24と第2のバンドパスフィルタ26とが直列接続されて構成される。これらローパスフィルタ20及び24並びにバンドパスフィルタ22及び26は、容量やインダクタンスにて簡単に構成できるため、図4に示すように、1つの誘電体基板50に内装することができる。

【0021】一方、受信側ダイプレクサ18は、送受切換器14からの2種類の受信信号S3及びS4が共通の入力端子φ6を通じて入力され、第1の出力端子φ7からは第1の周波数帯（例えば800MHz帯）の受信信号S3が出力され、第2の出力端子φ8からは第2の周波数帯（例えば1.8GHz帯）の受信信号S4として出力されるようになっている。

【0022】この受信側ダイプレクサ18は、例えば図3に示すように、第1の出力端子φ7と共通の入力端子φ6間に第3のバンドパスフィルタ30が挿入接続され、第2の出力端子φ8と共通の入力端子φ6間に第4のバンドパスフィルタ32が挿入接続されて構成される。これらバンドパスフィルタ30及び32は、容量やインダクタンスにて簡単に構成できるため、この場合も1つの誘電体基板50に内装することができる。

【0023】送受切換器14は、図示しない送受信スイッチによって送信と受信が切り換わるようになっている。該送受信スイッチは、例えばPINダイオードスイッチ、GaAs基板を用いたスイッチなどで構成する必要から誘電体基板50（図4参照）上に形成されることになる。

【0024】そして、この実施の形態に係る送受信装置10を製造する場合は、図4に示すように、送信側ダイプレクサ16と受信側ダイプレクサ18を同一の誘電体基板50内に形成し、この誘電体基板50の例えば上面に1つの送受切換器14を実装すればよい。

【0025】このように、本実施の形態に係る送受信装置10は、各構成部品のサイズが大きくなり、部品点数も多い送受切換器14の数を減らすことができるため、送受

信装置 10 の小型化を図ることができ、製造工程も簡略化することができ、しかも、配線の引き回しも簡単になり、設計の自由度を上げることができる。

【0026】特に、この実施の形態では、送信側ダイプレクサ 16 における各送信信号 S1 及び S2 の入力段にそれぞれ第 1 及び第 2 のローパスフィルタ 20 及び 24 を接続するようにしたので、送信特性を良好にすることができる。この場合、誘電体基板 50 内に形成される前記送信側ダイプレクサ 16 に、同じく誘電体基板 50 内に形成することが可能な第 1 及び第 2 のローパスフィルタ 20 及び 24 が直接接続されたかたちとなるため、ダイプレクサを構成する第 1 及び第 2 のバンドパスフィルタ 22 及び 26 と第 1 及び第 2 のローパスフィルタ 20 及び 24 を一つの誘電体基板 50 に形成しても、配線の引き回しは簡単なものになり、設計の自由度が制限されるということはない。

【0027】なお、この発明に係る送受信装置は、上述の実施の形態に限らず、この発明の要旨を逸脱することなく、種々の構成を採り得ることはもちろんである。

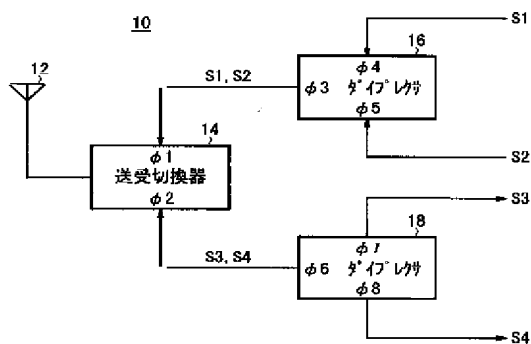
【0028】

【発明の効果】以上説明したように、本発明に係る送受信装置によれば、装置自体の小型化を図ることができ、しかも、製造工程の簡略化、並びに設計の自由度の増大化を実現させることができる。

【図面の簡単な説明】

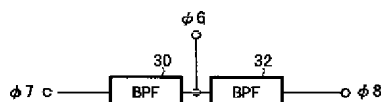
【図 1】

FIG. 1



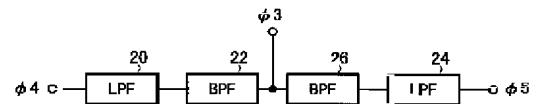
【図 3】

FIG. 3



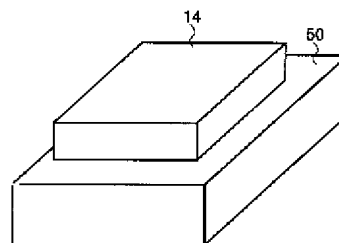
【図 2】

FIG. 2



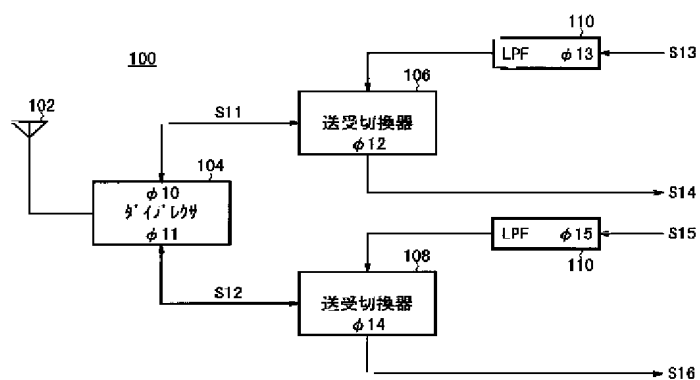
【図 4】

FIG. 4



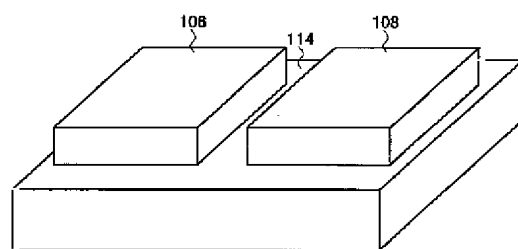
【図5】

FIG. 5



【図6】

FIG. 6



フロントページの続き

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